

METHOD OF HOSTING DIGITAL BUSINESSES

BACKGROUND OF THE INVENTION

1. Technical Field:

The present invention relates generally to computer software and, more particularly, to methods and systems for hosting digital components of businesses.

2. Description of Related Art:

The Internet, also referred to as an "internetwork", is a set of computer networks, possibly dissimilar, joined together by means of gateways that handle data transfer and the conversion of messages from a protocol of the sending network to a protocol used by the receiving network. When capitalized, the term "Internet" refers to the collection of networks and gateways that use the TCP/IP suite of protocols.

The Internet has become a cultural fixture as a source of both information and entertainment. Many businesses are creating Internet sites as an integral part of their marketing efforts, informing consumers of the products or services offered by the business or providing other information seeking to engender brand loyalty. Many federal, state, and local government agencies are also employing Internet sites for informational purposes, particularly agencies which must interact with virtually all segments of society such as the Internal Revenue Service and secretaries of state. Providing informational guides and/or searchable databases of online public records may reduce operating costs. Further, the Internet is becoming increasingly popular as a medium for commercial transactions.

Currently, the most commonly employed method of transferring data over the Internet is to employ the World Wide Web environment, also called simply "the Web".

Other Internet resources exist for transferring information, such as File Transfer Protocol (FTP) and Gopher, but have not achieved the popularity of the Web. In the Web environment, servers and clients effect data transaction using the Hypertext Transfer Protocol (HTTP), a known protocol for handling the transfer of various data files (e.g., text, still graphic images, audio, motion video, etc.). The information in various data files is formatted for presentation to a user by a standard page description language, the Hypertext Markup Language (HTML). In addition to basic presentation formatting, HTML allows developers to specify "links" to other Web resources identified by a Uniform Resource Locator (URL). A URL is a special syntax identifier defining a communications path to specific information. Each logical block of information accessible to a client, called a "page" or a "Web page", is identified by a URL. The URL provides a universal, consistent method for finding and accessing this information, not necessarily for the user, but mostly for the user's Web "browser". A browser is a program capable of submitting a request for information identified by an identifier, such as, for example, a URL. A user may enter a domain name through a graphical user interface (GUI) for the browser to access a source of content. The domain name is automatically converted to the Internet Protocol (IP) address by a domain name system (DNS), which is a service that translates the symbolic name entered by the user into an IP address by looking up the domain name in a database.

The Internet also is widely used to transfer applications to users using browsers. With respect to commerce on the Web, individual consumers and business use the Web to purchase various goods and services. In offering goods and services, some companies offer goods and services solely on the Web while others use the Web to extend their reach.

Often businesses utilize a third party host to provide some or all of the resources necessary to have an Internet presence for their business (e.g., e-Hosting). As the Internet has continued to grow, e-Hosting has developed into a way in which an online business might provide, for a fee, a computational components/services such as bandwidth, storage,

and computational power (CPU) to client businesses. Typically, these schemes restrict themselves to low-level services. Furthermore, they have relied on manual setup.

- Related to this, though at a more sophisticated level, are Application Service Providers (ASPs), which sell clients access to application programs (such as spreadsheets, Web storefronts, etc.). ASPs are in the “software rental” business. Typically, the applications they provide are intended for human users, and typically, again, the host-client relationship is manually set up, monitored, and maintained.

- However, none of these services meets the needs of so-called “digital businesses”. In a digital business, much or all of the firm’s day-to-day activity are partially or fully automated. Digital businesses may also automate tactical decision-making processes such as setting prices on products, negotiating trades, etc. Clearly, other parts of digital businesses, such as, for example, manufacturing, advertising, may also be partially or fully automated. With the continuing trend in e-business automation, digital businesses are fast becoming a reality. Therefore, there is an emerging need for a hosting service tailored specifically for the needs of digital businesses.

SUMMARY OF THE INVENTION

- The present invention provides a method, system, and computer program product for providing electronic business functions for a business client. In one embodiment, a host provides, on a data processing system, first level and second level services for several business clients. The first level services may include such features as storage, network connectivity, web hosting, and processing power. The second level services may include software designed to meet the specific needs of the business clients and may include such functionality as accounting services, inventory management services, price determination services, product and service ordering services, and negotiating services.
- 10 The host may facilitate transactions between one business client and another business client on behalf of the clients by identifying needs of one business client and identifying the capability of another business client to fulfill those needs. The host automatically completes the electronic portions of the transaction including ordering the item, updating inventory records, completing payment for the item (including updating accounting
- 15 records), and arranging for and monitoring shipping, if necessary.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented;

Figure 2 depicts a block diagram of a data processing system that may be implemented as a server in accordance with a preferred embodiment of the present invention;

Figure 3 depicts a block diagram illustrating a data processing system in which the present invention may be implemented;

Figure 4 depicts a block diagram illustrating an exemplary digital business hosting system in accordance with the present invention;

Figure 5 depicts a block diagram illustrating an exemplary e-business facility in accordance with the present invention;

Figure 6 depicts an exemplary process flow and program function for facilitating a business transaction between two business clients of a digital business host in accordance with the present invention;

Figure 7 depicts an exemplary process flow and program function for providing a customer ordering service to a e-business client via a digital business host in accordance with the present invention;

Figure 8 depicts an exemplary process flow and program function for setting prices for a e-business client's products in accordance with the present invention;

Figure 9 depicts an exemplary process flow and program function for managing a client's inventory in accordance with the present invention; and

5 **Figure 10** depicts a block diagram providing an illustrative example of how the host would preferably support fast, automated reconfiguration of the services "leased" to a client business in accordance with the present invention..

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented. Network data processing system **100** is a network of computers in which the present invention may be implemented. Network data processing system **100** contains a network **102**, which is the medium used to provide communications links between various devices and computers connected together within network data processing system **100**. Network **102** may include connections, such as wire, wireless communication links, or fiber optic cables.

In the depicted example, server **104** is connected to network **102** along with storage unit **106**. In addition, clients **108**, **110**, and **112** are connected to network **102**. These clients **108**, **110**, and **112** may be, for example, personal computers or network computers. In the depicted example, server **104** provides data, such as boot files, operating system images, and applications to clients **108-112**. Clients **108**, **110**, and **112** are clients to server **104**. Network data processing system **100** may include additional servers, clients, and other devices not shown. In the depicted example, network data processing system **100** is the Internet with network **102** representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational and other computer systems that route data and messages. Of course, network data processing system **100** also may be implemented as a number of different types of networks, such as for example, an intranet, a local area network (LAN), or a wide area network (WAN). **Figure 1** is intended as an example, and not as an architectural limitation

for the present invention.

While the present invention may be implemented in a distributed data processing system such as that shown in **Figure 1**, the present invention is not limited to any particular distributed data processing system architecture. Rather, the present invention
5 may be implemented in any distributed data processing system without departing from the spirit and scope of the present invention. For example, rather than a server/client architecture, such as that shown in **Figure 1**, the present invention may be implemented in a peer-to-peer distributed data processing system in which client computers communicate and interact with one another directly without requiring a server computing device to
10 facilitate such interaction.

Referring to **Figure 2**, a block diagram of a data processing system that may be implemented as a server, such as server **104** in **Figure 1**, is depicted in accordance with a preferred embodiment of the present invention. Data processing system **200** may be a symmetric multiprocessor (SMP) system including a plurality of processors **202** and **204**
15 connected to system bus **206**. Alternatively, a single processor system may be employed. Also connected to system bus **206** is memory controller/cache **208**, which provides an interface to local memory **209**. I/O bus bridge **210** is connected to system bus **206** and provides an interface to I/O bus **212**. Memory controller/cache **208** and I/O bus bridge **210** may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge **214** connected to I/O bus **212**
20 provides an interface to PCI local bus **216**. A number of modems may be connected to PCI local bus **216**. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to clients **108-112** in **Figure 1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216**
25 through add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI local buses **226** and **228**, from which additional modems or network adapters may be supported. In this manner, data processing system **200** allows connections to multiple network computers. A memory-mapped graphics adapter **230** and hard disk **232** may also be connected to I/O bus **212** as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may be, for example, an IBM e-Server pSeries system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) operating system or LINUX operating system.

With reference now to **Figure 3**, a block diagram illustrating a data processing system is depicted in which the present invention may be implemented. Data processing system **300** is an example of a client computer. Data processing system **300** employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Accelerated Graphics Port (AGP) and Industry Standard Architecture (ISA) may be used. Processor **302** and main memory **304** are connected to PCI local bus **306** through PCI bridge **308**. PCI bridge **308** also may include an integrated memory controller and cache memory for processor **302**. Additional connections to PCI local bus **306** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **310**, SCSI host bus adapter **312**, and expansion bus interface **314** are connected to PCI local bus **306** by direct component connection. In contrast, audio adapter

316, graphics adapter 318, and audio/video adapter 319 are connected to PCI local bus 306 by add-in boards inserted into expansion slots. Expansion bus interface 314 provides a connection for a keyboard and mouse adapter 320, modem 322, and additional memory 324. Small computer system interface (SCSI) host bus adapter 312 provides a connection
 5 for hard disk drive 326, tape drive 328, and CD-ROM drive 330. Typical PCI local bus implementations will support three or four PCI expansion slots or add-in connectors.

An operating system runs on processor 302 and is used to coordinate and provide control of various components within data processing system 300 in **Figure 3**. The operating system may be a commercially available operating system, such as Windows
 10 2000, which is available from Microsoft Corporation. An object oriented programming system such as Java may run in conjunction with the operating system and provide calls to the operating system from Java programs or applications executing on data processing system 300. "Java" is a trademark of Sun Microsystems, Inc. Instructions for the operating system, the object-oriented operating system, and applications or programs are
 15 located on storage devices, such as hard disk drive 326, and may be loaded into main memory 304 for execution by processor 302.

Those of ordinary skill in the art will appreciate that the hardware in **Figure 3** may vary depending on the implementation. Other internal hardware or peripheral devices, such as flash ROM (or equivalent nonvolatile memory) or optical disk drives and
 20 the like, may be used in addition to or in place of the hardware depicted in **Figure 3**. Also, the processes of the present invention may be applied to a multiprocessor data processing system.

As another example, data processing system 300 may be a stand-alone system configured to be bootable without relying on some type of network communication
 25 interface, whether or not data processing system 300 comprises some type of network communication interface. As a further example, data processing system 300 may be a

Personal Digital Assistant (PDA) device, which is configured with ROM and/or flash ROM in order to provide non-volatile memory for storing operating system files and/or user-generated data.

The depicted example in **Figure 3** and above-described examples are not meant to imply architectural limitations. For example, data processing system **300** also may be a notebook computer or hand held computer in addition to taking the form of a PDA. Data processing system **300** also may be a kiosk or a Web appliance.

With reference now to **Figure 4**, a block diagram illustrating an exemplary digital business hosting system is depicted in accordance with the present invention. The hosting system includes a host **404**, a network **402**, and business clients A **420**, B **422**, and C **424**. Host **404** may be implemented on one or several data processing systems, such as, server **200** in **Figure 2**. Business clients A **420**, B, **422**, and C **424** may be implemented as, for example, either server **200** in **Figure 2** or client **300** in **Figure 3**. Network **402** may be implemented as, for example, network **102** in **Figure 1**.

Host **404** provides the digital portions of the businesses for business clients **420-424**. Host **404** may provide some or all of the digital business aspects of each of business clients **420-424** served by host **404**. In a preferred embodiment, host **404** includes the following digital components:

1. Low-level services ("e-Utilities") provided by the host **404**;
2. High-level services or components provided by the host **404**;
3. Client-supplied high-level components; and optionally
4. Native peer services **414** provided by the host **404**.

Low-level services, which may be included in e-business client facilities **406-410**, are provided by the host **404** for use by client businesses **420-424**. A client business **420-424** negotiates for the amount of each utility; on the side of the host **404**. This negotiation is preferably automated. Preferably, as the client's **420-424** needs change, it could change

the amount of these services that it uses, renegotiate the terms, etc. Examples of these services include storage, CPU, and network connectivity.

The host **404** may optionally outsource, either by subcontracting or leasing the services or buying the services outright, some or all of the low-level services to an ordinary e-Hosting or e-Utility service. In this case, the host **404** serves as a provider of high-level services and/or native peer services, which use low-level services provided by the other low-level service provider in the usual fashion.

High-level services or components, which may be included in e-business client facilities **406-410**, provided by the host **404** are software components, modules, or services that are designed to meet the specific needs of digital businesses. They are designed and maintained by the host **404**. A client business **420-424** leases an instance of one, or the use of one. Clients **420-424** customize these services to suit their particular needs. Payment could be per-use, etc. As the client's **420-424** needs changed, it may change the selection of high-level components that it uses.

Necessarily, these high-level components would be able to operate in the host's environment. Preferably, they would be crafted to interoperate well with each other. Thus, one client **420** might use one component to transact business with another client **422** using a different component. For such a thing to happen, the two components must interoperate.

The host would preferably also provide means for interoperating with businesses that are hosted by other entities, or that are not hosted. These could take the form of low-level services for connecting to other hosts or business clients on the Internet; or high-level services for translating between the foreign host's or client's messaging protocols, interfaces, or the like, and those of the present host; or native peer services that perform the analogous activities for hire.

A client **420-424** may automatically or manually set strategic parameters & variables that would modify, govern, or constrain the behavior of the digital components or e-business client facilities **406-410** being provided by the host **404**. In the case of manual configuration, the component would provide information to the client firm's

- 5 **420-424** operators (e.g., by a Web interface) and receive modifications from the operators. In the case of automatic configuration, the component would receive configuration information using any standard communication interface (e.g., XML over SOAP).

- Examples of high level services include support for protocols for negotiation,
 10 payment or other communication, and ontology support. Other examples may include suites of automated negotiation strategies, bundling strategies, price-setting strategies, strategies for other things. A payment system is a natural component to provide, especially one that interoperates with the payment system used by the hosting service itself to collect from clients. A Universal Description, Discovery, and Integration of
 15 business on the web (UDDI) server may also be one of the high-level components available. (For more information about UDDI, see www.uddi.org.) The high-level components may include accounting, inventory management, order tracking, customer-relationship management, etc., software as well. Optionally, the high-level components would include subsystems that monitored the clients' use for billing &
 20 payment purposes.

Client-supplied high-level components may include software supplied by the client **420-424** that runs in the environment created by the host **404**. Client **420-424**-supplied software could make use of the total environment provided by the host **404**.

- 25 Both host-provided and client-supplied high-level components would preferably be able to take on the role of clients themselves, calling upon other services on the host

(whether low-level, high-level, or native peer) as they required, according to terms set by the client business.

Native peer services **414** that are optionally provided by the host **404** may include specific services that themselves appear as digital businesses -- e.g., "middle agents".

- 5 These would be available for hire by client businesses **420-424**, and especially by the digital components or e-business client facilities **406-410** operated by the hosting service. One advantage of this sort of setup is that a client business **420-424** may interact with the middle agents using the same software modules for communication, negotiation, decision-making, etc., that it uses for interacting with other digital firms. The host **404**
- 10 might deploy as many or as few native peer services as it sees fit, to maximize its total revenue. It may offer these services free of charge, or partially subsidize them, or let them alone. They might set fees, etc., to maximize their own profit. Examples of native peer services include directory service agents that maintain registries of firms and contact information, matchmaker agents that assist firms that need a particular service in finding
- 15 other firms that provide it, and brokers of various types.

For an example of how a matchmaker agent might operate, see commonly assigned U.S. Patent Application Serial No. 09/821,281 entitled "Seamless, Autonomous Introduction of New Goods and Services into a Dynamic Information Economy", filed on March 29, 2001, which describes a matchmaker agent operating as a free-lance business in an economy of digital businesses. The contents of commonly assigned U.S. Patent Application Serial No. 09/821,281 is hereby incorporated herein by reference for all purposes. A matchmaker operated by a hosting service, such as, for example, host **404**, could operate in a closely equivalent manner -- with one crucial difference: in the current invention it is under the ultimate control of the host **404**.

25 The host **404** transacts business with a client **420-424** in the same way any other digital business transacts business with the client **420-424**. Thus, by virtue of being

digital businesses, the clients **420-424** are equipped to negotiate for services and pay for them online. (In fact, the software used by the clients **420-424** for certain transactions may be supplied by the host **404** itself.)

Optionally, the client firm could establish an account with the host **404**. This
5 account could be set up online, possibly automatically, or it could be set up manually. It would preferably include a mechanism whereby the host **404** could receive payments from the client **420-424** in return for services rendered. But preferably it would not specify the components to be used by the client **420-424**, how much they would be used, etc. Within the terms of that account, the client firm **420-424** would operate its business
10 using digital components provided by the host **404** service. A client firm **420-424** need not run all of its digital components on the host **404**; only the ones it chooses to. And a client **420-424** might well have accounts with multiple hosting services.

One currently preferred means of doing this is for the host to provide a high-level
"account management" service that manages the client's account with the host. In that
15 way, the account-management service acts as a "general contractor", endowed by the client business with sufficient information to manage the client business's other hosted services.

The fees, terms & conditions of the provision of digital components to the client
420-424 are negotiated between the host **404** and client firm. Both sides of the
20 negotiation are either partly or fully automated, and (presumably) have control parameters set by the owners of the respective firms. The negotiations may be as simple as posted pricing by the host **404**, with acceptance or refusal by the client **420-424**.

Compliance is monitored automatically, e.g., using electronic Service Level
Agreements (eSLAs). An eSLA is a Service Level Agreement (SLA) that is expressed in
25 a form that may be read or parsed by a computer. An SLA specifies the characteristics, terms, conditions, and other features of a service provided by one business to another

business. SLAs typically contain items, such as, for example, specifications of the type of service to be provided, the quality level (e.g., reliability), the price or price schedule, means of payment, and remedies in case of failure. More information about eSLAs may be found in U.S. Patent Application Serial No. 09/642,526 filed August 18, 2000 entitled

5 “Electronic Service Level Agreement for Web Site and Computer Services Hosting” assigned to the International Business Machines Corporation, the contents of which are hereby incorporated herein for all purposes.

Billing is automated and the client's **420-424** payment process may be automated as well. The host **404** charges the clients **420-424** in any of several ways. Clients

10 **420-424** pay using any of several electronic payment schemes. Contracts may be negotiated automatically. But within a contract, leave certain things unspecified -- again, via an SLA. These things are executed automatically by the host **404**.

Host **404** may facilitate transactions between one of clients **420-424** and others of clients **420-424**. However, host **404** may also facilitate transactions between one of

15 clients **420-424** and businesses that are clients of other hosts are that are independent. Host **404** may facilitate transactions by handling client side aspects of negotiation, acceptance and completion based on parameters or other controls determined by the client.

Figure 4 is intended as an example, and not as an architectural limitation for the

20 present invention.

With reference now to **Figure 5**, a block diagram illustrating an exemplary e-business facility, such as, for example, any of e-business facilities **406-410** in **Figure 4**, is depicted in accordance with the present invention. E-business facility **500** includes low-level services **550** and high level services **552**. Low-level services **550** includes

25 storage **502**, web hosting **504**, network connectivity **506**, and computation (CPU) **501**. High-level services **552** includes order processing **508**, e-business communication facility

510, accounting & bookkeeping agent 512, pricing determination unit 514, inventory management 516, and customer demographic profiler 518.

Storage 502 allows a business to store all or some of their data and software applications. Web hosting 504 provides the web site, web pages, and other services associated with a web site for the business. Network connectivity 506 provides the business with a connection to the Internet.

The high-level services 552 may be applications provided solely by the host, by the business client or a combination of both. Order processing 508 receives and processes customer orders on behalf of the business client. E-business communication facility 510 provides expedited communications between the business client and other business clients of the host. Accounting and Bookkeeping service 512 provides the accounting and bookkeeping services to the business client. Pricing determination unit 514 determines the appropriate price to charge for the various products and/or services offered by the business client. Inventory management 516 manages the inventory of the business client by, for example, reordering inventoried items when the number of items falls below a client determined threshold level. Customer demographic profiler 518 collects and interprets demographic information about the customers that purchase items from the business client.

The host thus enables business to gain efficiency in the digital aspects of their businesses by allowing the host to perform some or all of their digital business aspects. One reason for this gain in efficiency is due to the fact that the software used for each business client is compatible with that used for other clients. Furthermore, by managing the digital aspects of business for several clients, the efficiency of the business conducted between those business clients is improved. For example, if the inventory item needed by one business client is purchased from another business client of the host, then inventory management 516 may order new inventory using order processing 508 and e-business

communications facility **510** to communicate with the other business client and order the necessary inventory item. The inventories of both business clients may be adjusted, the accounts credited or debited as appropriate and the shipping arranged for by the host without any action required of either business client. Another advantage is that, by

5 outsourcing the operation of the digital components of its business, a client business may devote more of its resources to its core competencies. Other advantages are also provided as will be obvious to one of ordinary skill in the art upon becoming familiar with the present invention as described herein.

Figure 5 is intended as an example, and not as an architectural limitation for the

10 present invention.

With reference now to **Figure 6**, an exemplary process flow and program function for facilitating a business transaction between two business clients of a digital business host is depicted in accordance with the present invention. These processes may be implemented on, for example, host **404** in **Figure 4**. To begin, the host under the control

15 of the client determines that a first e-business client needs a product from a second e-business client of the host (step **602**). The client may control the host by, for example, providing guidelines indicating how and when to make decisions on behalf of the client. This determination of e-business needs may be made, for example, by determining that the inventory level of a product has fallen below a threshold level determined by the

20 client business or because needed to complete a sale of an item to a customer of the first e-business client. The host then requests the product in appropriate quantities from the second e-business (step **604**). Again, the host requests the product subject to guidelines and restrictions placed upon the host by the client business. Thus, the client business may restrict the host to requesting and acquiring the product from a select number of

25 providers. The account of the first e-business client is then debited appropriately and the account of the second e-business client is credited appropriately (step **606**). The

inventory accounting for both the first e-business client and the second e-business client are adjusted appropriately by the number of products purchased by the first e-business client.

The host then arranges for shipping of the product if necessary (step 610) and
5 debits the account of the first e-business client appropriately to pay for the shipping charges. In some embodiments, the shipping company may also be a client of the digital business host and the transaction between the shipping company and the first e-business client handled completely by the digital business host. The host then tracks the shipping
10 of the product if necessary (step 612) and notifies both parties of the completion of the transaction when the transaction has been completed (step 614). Thus, the host does not take charge of either the purchasing or selling the clients business, but merely provides services that carry out specific business-related tasks (e.g., inventory tracking) according to the instructions of, and under the supervision of, the client.

Thus, for example, an inventory tracking service provided by the host to client
15 business A and configured by client business A according to its needs, observes a need for buying a particular part. Suppose that the inventory tracking has been set up (by the client business or at least with the client business's consent) to notify a specific purchasing service (possibly also provided by the host) of this need. The purchasing service, on being notified of the need, initiates a search for the part. The purchasing service has also
20 been leased to, and configured by client business A, for example, to execute a particular strategy in selecting vendors and negotiating purchases. The purchasing module carries out its task, and notifies, for example, an accounting module to pay the purchaser. The accounting service has also been leased to, and configured by client business A. It contacts client business B to learn how to pay for the purchase and then carries out the
25 transfer.

With reference now to **Figure 7**, an exemplary process flow and program function for providing a customer ordering service to a e-business client via a digital business host is depicted in accordance with the present invention. To begin, the digital business host provides an ordering interface to a customer via the Internet or other network on behalf of the e-business client (step 702). The host then receives ordering information from the customer (step 704) and determines whether the ordered product is software (step 706). If the ordered product is not software, then the e-business client is notified to pull appropriate product from inventory and have available to ship to the customer (step 710). The host then makes shipping arrangements (step 712) and obtains payment from the customer (step 714). If the ordered product is software, such as, for example, computer application software, music, or movies, then the host retrieves the appropriate software from a on-line storage and sends the software to the customer over the network (step 708) after obtaining payment from the customer (step 714). After payment has been obtained from the customer, the host credits the e-business clients account with the customer payment (step 716) and adjusts the inventory of the e-business client (step 718).

As an alternative, rather than sending software electronically, a physical product containing the software may be shipped to the customer instead. For example, the software may be encoded on a digital versatile disc (DVD) and the DVD shipped to the customer.

With reference now to **Figure 8**, an exemplary process flow and program function for setting prices for a e-business client's products is depicted in accordance with the present invention. To begin, the host receives pricing criteria from the client (step 802). For example, the criteria may state that the price should be set such that it is equal to the cost of the product to the e-business client plus a certain percentage of the cost or a plus a given dollar amount. Alternatively, the price may be set based on demand or such that no other companies product in the same category is priced lower than the product offered by

the e-business client. Once the pricing criteria is received, the host stores the pricing criteria (step 804) and appropriate data is gathered and analyzed to determine the price (step 806). If the client has requested that the price be set based on the price other businesses charge for the same product, then the host may monitor related businesses

- 5 prices by, for example, searching the web, (step 808). The host then sets the price for the client product (step 810). This price setting process may be a constant ongoing process to keep the client's product price in line with market conditions as well as maintain a profit for the client.

- 10 With reference now to **Figure 9**, an exemplary process flow and program function for managing a client's inventory is depicted in accordance with the present invention.

- To begin, a host, such as host 404 in **Figure 4**, monitors an e-business client's inventory (step 902) and determines whether inventory levels are below a client determined level (step 904). If the inventory levels have not fallen below a threshold level, then the host continues to monitor the client's inventory. If, however, the inventory has fallen below a
- 15 threshold level, then the host determines whether the inventory item is a manufactured item or a purchased item for the client (step 906). If the item is manufactured by the client, then the host sends a message to the client or client's manufacturing section to produce more of the inventory item (step 908). If the inventory item is purchased by the client, then the host selects an appropriate vendor from which to order inventory refills
- 20 (step 910). The host then orders the appropriate amount of the inventory item from the selected vendor, arranges shipment if necessary, and monitors the shipment (step 912). As the manufactured items or the purchased items are received, the host receives confirmation from the warehouse or other storage facility and adjusts the inventory records accordingly (step 914).

- 25 With reference now to **Figure 10**, a block diagram providing an illustrative example of how the host would preferably support fast, automated reconfiguration of the

services "leased" to a client business. Consider the following. Suppose the client business **1002** is a bookseller, and that it adds a new book to the catalog service **1006** it is leasing from the host **1004**. Suppose that the book is in great demand, so that the addition of the book causes a sudden inrush of online shoppers **1008-1012** viewing its entry in the catalog **1006** and buying it.

The catalog service **1006** has been configured (by the client business **1002** or by the host **1004** with the client's consent **1002**) to buy additional bandwidth **1014** and CPU **1016** when necessary, and to report to the account manager **1018** service any sudden increase of requests for information pertaining to any single product (especially a product newly added, or changed). The shoppers' **1008-1012** activity triggers both of these effects.

The account manager service **1018** has been configured (again, by the client **1002** or by the host **1004** with the client's **1002** consent) to respond to this notice as follows: it informs the order-tracking **1020**, inventory management **1022**, and accounting services **1024** leased by the client business **1002** that they should increase their capacity to process new orders.

Each of these three high-level services request additional services from the host **1004**: the order-tracking **1020** requests additional bandwidth **1014**, the inventory **1022** and accounting **1024** request for additional CPU **1016** to be reserved for it over the next few days. Under the terms of the overall agreement between the host **1004** and the client business **1002**, and the particular configuration of the services by the client business **1002**, the services' requests are processed by the host **1004**, and the services are provided.

When the rush of orders is over, all four of the high-level services cancel the additional bandwidth **1014** and CPU **1016**.

The host **1004** might bill the client business **1002** directly for the additional usage, might bill the clients **1002** account manager service **1018**, or might bill the catalog **1006**,

etc., services, which would pass the charge on to the account manager 1018.

The gains in efficiency due to automation supplied by the present invention are obvious. Furthermore, because the setup of business relationships is automated, the hosting service permits a vastly greater degree of adaptability in client firms.

- 5 Another advantage of such hosting is that the client firms do not have to own and administer their own computational infrastructure for these components. The hosting service may maintain and upgrade the components it offers. It may offer new ones. This permits client digital businesses to focus on their core functionality.

- 10 A further advantage is that these hosted businesses have extremely fast communication paths with each other, so it may be possible for them to do business with each other more effectively than "outside" businesses could. This could give rise to "digital cities", in which businesses cluster "near" each other for the same economic efficiencies that give rise to human cities.

- 15 A further advantage is that the hosting service will help ensure that hosted firms have greater interoperability capabilities than others. For example, the hosting service may make sure that all of the digital components it hosts conform to a common standard of interaction language, ontology, communication protocol, etc.

- 20 It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media, such as a floppy disk, a hard disk drive, a RAM, 25 CD-ROMs, DVD-ROMs, and transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms,

such as, for example, radio frequency and light wave transmissions. The computer readable media may take the form of coded formats that are decoded for actual use in a particular data processing system.

- 5 The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with
- 10 various modifications as are suited to the particular use contemplated.